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The importance of popularity, rational thinking style and nonverbal sensitivity to achieve academic success

Loredana Ivan[a,]*

[a] *University of Bucharest, Sociology Department, Mihail Kogalniceanu 35-46, Bucharest 050107, Romania*

Abstract

We investigate weather popularity in the academic related networks and the way students are proccessing information – rational or experiential predict their final grades. Additionally, the role of nonverbal sensitivity is discussed in relation to group popularity. First year college students (N=72) completed a sociometric questionnaire. They have been also tested on their accuracy to decode nonverbal cues (PONS, Rosenthal et al., 1979) and on their thinking style (REI, Pacini and Epstein, 1999). Being popular in the 'information exchange' network predicts their academic performances in the end of the semester. Also nonverbal sensitivity played an important role for the non-academic related ties, especially those based on support.The correlation between rational thinking style and students grades was rather weak, compare to similar studies.

Keywords: Group popularity; Academic performances; Nonverbal sensitivity; Thinking style, Network centrality

* Corresponding author. Tel.: + 40-723-276080; fax: + 40-21-3180887
E-mail address: loredana.ivan@comunicare.ro

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1. Introduction

Researches about factors that could influence academic performances have been for long time reduced to internal conditions as for example the inherited potential, the level of intelligence, the motivation or to learning involved processes as attention, perception and memory. However after 1980 two new directions to research academic success evolved: one which focused on external factors as possible predictors for academic performances, namely parental involvement, socio-economic status, institutional factors, the number of students in class, cooperation and competition among the school peers including class socio-affective climate; and the second one which stressed on students' cognitive abilities and their experiences in using cognitive resources to achieve academic success (see Shivpuri et al., 2006).

When talking about relational resources as predictors for academic performances, most researchers (Folger, 1989; Finn, Gerber and Body-Zaharias, 2006; Papalia, Olds and Feldman 2008) recommended small size classes – maximum 25 students – as a key factor for school performances because they positively influence the level of attention and participation, interactive learning and task comprehension. Such results are consistent both on secondary and tertiary education studies, proving that seminar groups from the university institutions have a positive impact on performances compare to courses with large groups (e.g. Folger, 1989). Another relational factor which has been treated in the literature concerns peers acceptance: secondary school and university students who proved to be liked or integrated in their peer group, tended to have higher academic performances, they were more motivated to participate in class and they trusted more their possibilities to achieve higher grades (Berndt, Perry and Miller, 1988; Freeman, Anderman and Jensen, 2007; Cheng, Lam and Chang, 2008). Investigations conducted on first year students (Dwyer et al., 2004; Edman and Brazil, 2007) proved that the more they feld they belong to the academic community, the higher their grades and their willigness to graduate from the university. Those who reported high level of academic community involvement had also more self-efficacy, and higher motivation to study, were more emphatic and willing to help other colleagues or to solve potential group conflicts (Dwyer et al., 2004, 265). More specific studies about the impact of socio-affective climate for academic performances (Berndt, Perry and Miller, 1988; Kutnick and Kington, 2005) argued about the importance of having friends within the school group. Although they reffer mainly to primary and secondary education level, these studies show that students who had more friends in their class or in their working group tended to have also higher school performances and less difficulties to adapt to an upper educational level compare with those with no friends in class. In a similar research on university students, Civettini (2007) found a positive relation between perceived similarity in peers groups and academic performances, proving that class friendships could be a variable in the equation also for tertiary education.

2. Individual and relational resources in predicting academic performances

Students might easy become friends with others from their school group when they perceive them similar but also when they have good communication abilities. Studies about the role of communication skills in predicting academic success lack the construct validity. Either they refer more to academic self-confidence or self-adjustment and not really to academic grades as a measure of student performances in school, or they are not really measuring communication abilities with standardized instruments but with informant-based reports on individual' social skills in general. For example a study conducted on Hispanic teenagers leaving in US (Acoach and Webb, 2004) found that the ability to decode nonverbal elements – due to their brokering language perspective – increased their academic self-confidence and as a result their school performances as well. Also a longitudinal study following 4-5 years of age children until the fifth grade (Konold et al., 2010) argued that social skills – measured by both teachers and mothers reports – are valid predictors of student' achievements, especially in applied problems and letter-word identification. A similar longitudinal study (Rubin, Graham and Mignerey, 1990) conducted on university students, using standardized communication skills instruments produced contradictory results: although students' communication competencies did not correlate with their performances during the university years and 'having a communication course in their curricula' was also not a significant predictor, the study found positive correlations between the communication competencies scores and academic performances, for the final university year. This

research concluded also that students with low communication skills have higher probability to drop university than those with high communication skills.

However, the influence of individual social or communication skills on a specific output is difficult to isolate because the concept of 'social skills' is a slippery one, broadly defined and context related (see Hall and Bernieri, 2001). We can only talk about specific social competencies and their influence on academic results. For the present research we refer to nonverbal sensitivity as a dimension of social skills, defined as the ability to interpret nonverbal cues in emotional situations (Ivan 2009, p.135) which probably interfere more in friendship related ties. Actually, a study conducted by Nowicki and Marshall (1992) on primary school students showed that children with high abilities to decode emotions especially on face and voice channel were also popular in their peer groups and got higher school performances. The positive relation between nonverbal sensitivity – as the ability to decode nonverbal cues – and popularity has already been proved on a number of studies on children (Walden and Field, 1990; Hubbard and Coie, 1994; Boyatzis and Satyaprasd, 1994) and adults (Carton, Kessler and Pape, 1999) although popularity has not been consistently defined. Nowicki and Marshall (1992) suggested that the relation between nonverbal sensitivity, popularity and school performances is to be found especially in primary school settings where education is mainly an interpersonal process.

2.1. Group popularity and academic performances

One methodological problem when assessing popularity in groups is the way to measure it. Most of the studies (e.g. Carton, Kessler and Pape, 1999) have used relevant others evaluations and not a structural approach on the real individual position in relation to other members of the group. In recent studies a structural approach has been used to assess popularity, using Social Network Analysis. SNA enables researchers to have a visual representation of different types of ties (e.g. exchange of information, support, friendship, trust) in a specific social network and to quantify the importance of each involved actor relative to others or to the entire network density or connectivity. SNA could be describes as an assembly of tools to assess people prominence, collaborations and efficiency in the social structures they are part of (Wasserman and Faust, 1994). SNA refers to 'actor popularity' in terms of centrality indicators. Central actors are the most visible ones and when measuring centrality we describe the efficiency of an actor in the social network by counting both direct and mediated ties (Kenis and Knoke, 2002; Knoke and Yang, 2008).

Researchers conducted on secondary schools (four to seven grades), using SNA proved that children with similar academic performances are closer in their networks, developed more sub-groups and, generally speaking have higher centrality level (Xie, Cairns and Cairns, 1999; Flores-Gonzales, 2005). Similar studies on adult graduate students confirm the relation between social network centrality and academic success: college students' social network behavior has been positively associated with their academic grades (Thomas, 2000; Hwang et al., 2007; Steinfield, Ellison and Lampe, 2008) However, more specific analysis presented the importance of peculiar ties in achieving academic success. A research conducted on master's students (Cho et al., 2007) proved that centrality in friendship, communication, and adversarial ties had a positive impact on students' attitudes and grades. Other researches on graduate students (Pilbeam and Denyer, 2009; Secundo and Grippa, 2009) indicate that academic achievements were positively correlated with the level of external connectivity (outside university ties) and negatively correlated with the density of individual's friendship network. A panel study on five hundred second year university students (Trippet, 2005) found that individual's structural positions in the network – using ties about 'participation in organizations' and 'knowing relevant others in university' – were not related to academic performances (cumulative GPA) but with similar satisfaction with university and courses.

The relation between popularity and academic performances could work both ways: those already proving high academic achievements could become popular among their peers and they would often be chosen as interaction partners, at least in support or information exchange ties and also people could benefit from their popularity by using group resources and achieve higher academic grades.

2.2. Thinking styles and academic performances

Thinking style theories have been developed to explain individual's preferences to process information in a specific way (Sternberg, 1997) when solving problems or interacting with others. There were presented as a link between personality trait theories and cognitive ability (Murphy and Jeneke, 2009) in the attempt to explain individual differences in treating information and tendencies to pursue a particular strategy when solving a cognitive task. One influential model about different information processing modes is suggested by Epstein (2000; 2003) using cognitive experiential theory. CEST describes two parallel systems of information processing with several reciprocal influences: one preconscious, experiential and another one rational and conscious. The experiential mode of information processing is presented as involuntary, automatic and nonverbal. It is based on emotions and generates, in turn, emotions: experiential system appeals to specific events, emotional loadings stocked in memory or generalized cognitive elements connected to emotions as, for example, prototypes or metaphors (Epstein, 2003, 5). The rational system of information processing is based on logical inferences, is analytic and involves cognitive effort (that the individual is not always prepared to invest in a task), is voluntary and cognitive resourceful dependent. Epstein et al. (1996) have suggested that individuals' preferences to process information either analytic or holistic can be described as a personality trait beyond the situational resources in general or the task specificity. As a result, individuals' differences in the way they process information have been evaluated using REI (Rational Experiential Inventory).

There have been a large number of researches using REI since the initial version (Epstein et al., 1996) proving the value of the two components in predicting several behavioral outputs: group adaptation and the level of involvement in new situations, the ability to interpret messages and to experience cognitive errors. Both components and especially rational style could predict school performances and school adaptability (Hogarth, 2001; Novak & Hoffman, 2009). Although researchers are using different REI versions (see Klaczynski, Fauth and Swanger, 1998; Pacini and Epstein, 1999) the results confirmed that rational thinking positively correlates with intellectual performances, self-determination, optimistic views about yourself and life in general, while experiential dimension positively correlates with extraversion and willingness to be liked by others, with the tendency to establish social connections (Epstein, 2003, 40).

For the present research we consider the interplay between group popularity, thinking style and nonverbal sensitivity in relation to academic performances, using a first year college sample. We predict a positive relation between students' level of centrality, especially in academic-related networks (as 'exchange of information') and their school performances and a moderator effect of nonverbal sensitivity on popularity, especially on relations defined by trust and support. We test also the possible relation between participants' thinking style (rational or experiential) and their academic performances.

3. Methodology

3.1. Participants

The research was conducted on 72 first year college students from a Romanian private university, attending a course of Communication Theory and interacting on daily basis in five seminar groups of 24 to 25 students each. The students were mostly females (86%) aged 18 to 35 ($M = 19.90$; $SD = 2.37$), with no previous participation in similar researches. Information about their peers' grades before enroll in university have not been available to the participants. At the moment we conducted the research they were attending courses in the beginning of their first university semester and they were not aware of any evaluation results or university grades. Since groups were defined by alphabetical order and not by performances or preferences, we can assume no significant difference in age, gender or others socio-demographic variables between the five seminar groups.

3.2. Measures and procedure

First, the participants from all five groups have been tested with *Face and Body PONS* (Rosenthal et al., 1979). This form contains visual items from the full PONS, 20 body-only items and 20 face-only items and consists in 40 slides, 2 seconds each enacted by a young woman (aged 24, white, resident in US) who is filmed when expressing spontaneous emotions associated to different situations: some with low emotional intensity (e.g. 'ordering food in a restaurant') and other with high emotional intensity ('expressing jealous anger'). The face and body PONS measures nonverbal sensitivity on visual channel only, having a *.63* overall reliability. The internal consistency of the PONS ranges from *.86* to *.92* and its median test–retest reliability is *.69* (Ambady, Hallahan and Rosenthal, 1995). The visual channel scores significantly correlate ($r = .50$, $p < .001$) with the full PONS (Rosenthal et al., 1979, p. 53). Participants have to choose the correct answer from a dual answering sheet.

Second, participants have to answer the items from *The Rational Experiential Inventory*, Romanian version translated and adapted for the student population (Ivan, 2010) using a 5 point Likert scale, from '1' – 'not at all true for me' to '5' – 'extremely true for me'. This version of REI has 24 items distributed on two subscales: 10 items on rational processing scale (e.g. 'I am much better at figuring things out logically than most people') and 14 items on experiential processing scale (e.g. 'I like to rely on my intuitive impressions'). The subscales are parallel measures of the thinking style preferences ($r = -.08$, $p > .05$) with high internal consistency (rational $\alpha = .88$; experiential $\alpha = .93$).

We obtained *relational data using a sociometric questionnaire* with a roster of names. We decided for a free-choice design, with no restrictions for the number of chosen actors, recommended in the literature when we assess centrality in ego-centered networks (Wasserman and Faust, 1994). Eight relational ties were analyzed: four connected with the educational environment – 'delegate someone to represent you on the academic level', 'cooperate with somebody in a project', 'looking for information about courses', 'looking for expertise in finding a job'; and four connected with outside college activities: 'take initiative in recreational actions', 'asking for financial support', 'looking for emotional support', 'like to share a positive event with'. Separate rosters of names were given for all five seminars and students were asked to choose only peers from their group. For example if we wanted to assess the 'cooperation in a project' network we asked them 'With whom you would like to work together in a project to be presented in a student session in your faculty?' and the answers were dichotomous 'yes' or 'no' for each individual from the list. Similarly, if we wanted to assess the 'emotional support' network we asked them: 'To whom you would share personal information about a family issue?' The data were analyzed using the Social Network Analysis software tool UCINET (Borgatti, Everett and Freeman, 2002). The responses were used to generate adjacency matrices – with the names of each student on both line and column and student interactions (1 – present, 0 – no present) – for all five groups of students and each of eight relational ties. We calculated individual's centrality in each of the networks using degree centrality for the non-directional relational ties as for example 'cooperate with somebody in a project' and we add in-degree centrality as indicator of centrality in directional ones as 'looking for information about courses'. Popular actors are most of the time the 'object' and not the 'source' of the relation and in-degree and out-degree centrality indices are used in SNA to make such distinction. However, in case of directional ties, isolates, those who have no contribution to the analyzed network, are deleted. In order to compare those centrality indices across the five groups involved in the research, normalized measured were calculated.

Two months after the research has been conducted, we collect *information about student's grades* from the Communication Theory teachers who had assessed their performances only on this subject. Two separate teachers evaluated the students on a five points scale, from '1' - 'poor' to '5' – excellent. Additionally we had access to their cumulative performances in the end of the semester, The Average Cumulative Grade (ACG).

4. Results

The mean of nonverbal sensitivity scores (using Face and Body PONS) for our first year student sample is similar with standardized group: face ($M = 15.51$, $SD = 1.66$); body ($M = 14.46$, $SD = 1.53$), total ($M = 29.97$, $SD = 2.35$).

Only in case of face-only items our subjects, especially males, scored lower. The analysis of variance (ANOVA) yielded significant gender effect ($F = 8.131$, $df = 1$, $p < .006$) in case of total PONS accuracy and body-only accuracy ($F = 7.176$, $df = 1$, $p < .01$), female students being more accurate than male students, especially in decoding body-only items. Student's academic achievements did not correlate with their ability to decode nonverbal cues on visual channel. The relation between the two variables seems rather negative, $r = –.232$, $p = .06$ for body-only accuracy and academic grades on Communication Theory course and non significant in case of Average Cumulative Grade.

As we predict there are significant correlations between nonverbal sensitivity measures and prominence in the networks, only for outside college activities relational ties and not between subjects' popularity in the networks defined as 'academic-related' and their nonverbal accuracy scores. In fact, among the four 'non-academic' relational ties: 'take initiative in recreational actions', 'asking for financial support', 'looking for emotional support', 'like to share a positive event with', the scores of nonverbal accuracy modestly correlated with the individual centrality only in case of 'financial support' and 'initiative in recreational actions'. Subjects who were more involved in actions of financial support in their network, either because they choose many others to interact with or they were chosen for such interactions are those who got also higher PONS scores, particularly in case of face-only items, $r = .290$, $p < .05$. Those findings suggest the hypothesis that nonverbal sensitivity students are central in the networks defined by 'financial support' ties. In case of 'initiative in recreational actions' ('whose proposal of a funny trip you would follow?'), the nonverbal accuracy is negatively correlated with individuals' centrality, $r = -.258$, $p < .05$. In this case we measure prominence in the network by out-degree centrality – that counts for all the relations in which an actor chooses others to interact with. The obtained negative correlation could be interpreted as a less willingness to involve in out-side school recreational ties of those with high nonverbal sensitivity, especially on body items. However, the negative relation between nonverbal sensitivity and centrality in case of recreational actions outside the faculty could be due to gender differences in ability to decode body items. We have already showed that female from our sample were significant more accurate than males in decoding body-only items. And indeed, when we control for gender, the relation between nonverbal sensitivity and centrality in the recreational ties remains non-significant. This happens also because females proved to be more reluctant than males in choosing colleagues from the network to spend time outside university: the mean out-degree centrality level for females was significant lower than for males subjects, in this case ($t = –1.933$, $df = 57$, $p < .05$).

When analyzing the influence of popularity on students' grades, we correlated the centrality indices that have been already described with student grades (Communication Theory grades and Average Cumulative Grade in the end of the semester), for all eight relational ties. We test for gender effect on grades and we find no significant difference between female students' grades and male students' grades, in our sample. The data support our predictions, since students' grades did not correlate with non-academic relational ties centrality indicators, but significantly correlated with centrality measures on three out of four educational-related ties: 'delegate someone to represent you on the academic level', 'looking for information about courses', 'looking for expertise in finding a job' (Table 1). The data show a positive relation between participants' academic grades, both in case of Communication Theory Course and Average Cumulative Grade, and the level of centrality in undertaking formal leadership positions ($r = .398$, $p < .01$; $r = .418$, $p < .01$) and also between grades and participants' prominence as information sources, ($r = .540$, $p < .01$; $r = .470$, $p < .01$) Similarly, the higher the grades someone has in the end of the semester, the more he is considered 'a good adviser' in finding a job, ($r = .466$, $p<.01$; $r = .409$, $p<.05$). Being central in the 'cooperation' network is also positively correlated with the Average Cumulative Grade in the end of the semester ($r = .466$, $p<.01$), although for the particular course of Communication Theory the correlation is week (Table 1).

Table1. Correlation matrix: student achievements and prominence in academic related ties

	Delegate someone to represent you	Cooperate in a project	Information about courses	Expertise to find a job	Course grade	Average Cumulative Grade
Delegate someone to represent you	—					
Cooperate in a project	.378**	—				
Information about courses	.811**	.429**	—			
Expertise to find a job	.537**	.179	572**	—		
Course grade[a]	.398**	.161	.540**	.446**	—	
Average Cumulative Grade[b]	.418**	.466**	.470**	409*	.354**	—

**p < .01 two-tailed, *p < .05 two-tailed

[a] Communication Theory Grades (5 points scale, '1' – 'poor'; '5' – 'excellent')

[b] The cumulative performances in the end of the semester (10 points scale)

We proceed for a hierarchical regression in order to find which of the relational factors mentioned above could have a significant impact in predicting the final grades. Being central in the 'information network' was the only variable accounted for significant variance in Communication Theory grades ($R^2 = .265$), more than if we take into account the variance of means ($F\ Change = 9.356,\ p < .01$). When increasing the level of centrality in the 'information based' network we will get a significant increase in the student grade for this particular course ($\beta = .514,\ p < .01$). Similarly, being central in the 'information network' was a significant predictor for the variance of the student cumulative performances in the end of the semester ($R^2 = .233,\ F\ Change = 8.814,\ p < .01$). Being central in the information network in sense that others expect from you information about courses and they are considering you a reliable source to offer such information would probably force the student to meet the expectations, increasing his chances to get higher grades in the end of the semester ($\beta = .483,\ p < .01$).

There have been no significant correlations between the two REI subscales and subjects' ability to decode nonverbal cues, when using Face and Body form of PONS. The relation between the two variables is modest and negative indicating the fact that those relying more on intuition are less able to decode visual cues, specific to PONS items. The negative relation between nonverbal accuracy and experiential processing mode is stronger in case of body-only items ($r = -.10,\ p>.05$) than of face-only items.

We have got also no significant correlation between REI scores and students grades. The relation points in the expected direction ($r = -.05,\ p>.05$ for the experiential scores and $r = .18,\ p>.05$ for the rational scores), when we consider the fact that evaluation in college is based mainly on tasks that require more rational and analytical abilities and less holistic-intuitive resources. However we fail to provide evidence for a significant positive influence of rational thinking style on academic performances.

5. Conclusion

We did not find any significant relation between student academic grades on both Communication Theory course and the Average Cumulative Grade in the end of the semester and nonverbal sensitivity scores (measured by Face

and Body PONS). Our results are consistent to previous ones (Rosenthal et al., 1979) which found modest correlations between PONS test results and subjects' general intellectual abilities and no correlation with subjects' cognitive complexity in general or their IQ. However we used only visual channel items to measure nonverbal accuracy and future researches should also include other measurements of nonverbal sensitivity that take also into consideration the audio and mix channels. We also conclude that nonverbal sensitivity correlates with individuals' prominence in the non-academic relational ties and not with their popularity in the academic-related ones. Our data support such hypothesis, especially in case of 'asking for financial support' network. Females had higher nonverbal accuracy scores than males (especially on body channel) and were also more reluctant in being involved in outside school recreational ties with peers from their student group. It seems that females are more selective in choosing colleagues to interact with outside university. This behavioral pattern could be accompanied by selective ways to access information in case of nonverbal sensitivity tasks.

We could not offer support for a possible relation between thinking styles and academic performances, at least for the present student sample. We should take into account the difference between self-evaluation of cognitive style and the real use of rational or experiential resources in a particular task. The real use of cognitive resources could still remain a relevant predictor for the performances in a variety of situations, even though the perceived use of cognitive resources is context related. University students could be highly motivated to include in their self description more use of rational resources, because this is consistent with their role in university and in such cases the self descriptive measurements lack the necessary predictive validity. Additional instruments that could assess participants' real cognitive preferences in several tasks are needed for future researches.

The findings suggest the fact that 'academic related' networks, as 'looking for information about courses' or 'find a competent advise about how to get a job' are mainly centralized around those with higher academic grades. Academic achievements correlated with individuals' centrality in the education-related networks. Students who are trusted as formal leaders to represent the group on faculty level and are more efficient in 'cooperating in faculty project' networks manage in the end to get the higher grades. The fact that grades were not correlated with centrality indices in non-academic related networks proved that the relation between prominence in group and academic achievement should be different interpreted, taking into account the specificity of the relational tie, in this case academic or non-academic related.

Finally, among the four academic-related networks took into consideration in the analysis, only one variable: 'being central and enjoy prestige in the information network' significantly predict the variation of grades. When a student had more direct and indirect ties in the information network and especially when he was the object of those ties, meaning he was credited by others as an 'information source', he had also higher chances to receive a better grade in the end of the semester. One might think that our data show that individuals are able to correctly identify those who previously got higher grades and name them 'information reliable sources'. If that was the case, then the level of academic achievement would have become an independent factor explaining the individual centrality in the information network. However, we choose freshmen students who were in the beginning of their first semester, so they did not have anticipations about fellow their colleagues' grades. Instead they could have just assessed each actor informational potential based on daily interactions and their assessments proved to be valid when compare them with the grades obtained in the end of the semester.

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